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Remarks:

These remarks are responsive to the Office action dated February 12, 2007. Prior to entry of this response, claims 1-28 were pending in the application. By way of this response, claims 1, 15, 19, and 27 are amended, claims 8 and 21-23 are cancelled. Applicants respectfully request reconsideration of the application and allowance of the pending claims.

Rejections under 35 USC § 102

Claims 1-28 are rejected under 35 USC 102(b) as being anticipated by U.S. Patent Number 6,332,446 (Matsumoto).

Claims 1, 3-9, 11, 13-15, 18-23, 25 and 27-28 are rejected under 35 USC 102(e) as being anticipated by U.S. Patent Number 6,318,348 (Xu).

Claims 1-28 are rejected under 35 USC 102(e) as being anticipated by U.S. Patent Number 6,857,264 (Ament).

Applicants respectfully traverse the rejections, but have amended various claims to advance prosecution as described below. However, before responding in detail, Applicants believe it may be helpful to review some background information. As noted in Applicants' specification, one approach of controlling torque imbalance between active and inactive cylinders is to use opening/closing of the intake or exhaust valve of the deactivated cylinders. Such an approach is described in Matsumoto.

However, Applicants specification also notes that an issue with Matsumoto is that there may be conditions under which the additional costs of opening/closing valves of the deactivated cylinder produce little to no appreciable improvement in vibration, such as at higher speeds and/or loads. As such, in one example, by selecting among different cylinder deactivation modes (e.g., one using torque balancing via opening/closing of valves in deactivated cylinders, and another in which valves of deactivated cylinders are held closed) it possible to provide improved vibration where such vibration improvement is appreciated by

an operator, and improved efficiency where vibration improvements may not be appreciated or noticed.

Thus, as noted in the Summary of the present application:

by utilizing both open and closed valve deactivation, depending on operating conditions, it is possible to both reduce engine vibration, while at the same time obtaining high fuel economy. In other words, in conditions where closed valve deactivation might otherwise cause excessive vibration, it is possible to reduce said vibration by utilizing open valve deactivation. Likewise, in conditions where such vibration may not be excessive or noticeable by the engine operator, it is possible to utilize closed valve deactivation and obtain higher fuel economy since energy is not spent opening and closing valves in cylinders not carrying out combustion.

Applicants have further realized that the above driver perception and fuel economy balance may be realized using engine speed as a parameter in selecting engine cylinder modes, such as described with regard to Figure 10, for example.

As will be described below, none of the cited art recognize that this opportunity exists, or how to realize this result.

Matsumoto

Applicants have reviewed Matsumoto and can find no disclosure of selection of the different cylinder deactivation modes (the second mode and third mode of claim 1, for example) in coordination with engine speed. As such, Applicants respectfully submit that it would be impossible for Matsumoto to select the second mode at a lower speed than said third mode.

With regard to claim 8, the Office action asserts with regard to Matsumoto:

Regarding claim 8, the reference of Matsumoto et al further discloses the distributed processing architecture can be used for maximum data/signal processing capability and speed (col. 13, lines 28-61).

Applicants respectfully submit that whether or not an architecture may be used for "maximum data/signal processing capability and speed" says nothing about adjusting cylinder operation based on engine speed. While both

processing speed and engine speed use the term "speed", the similarities end there.

Furthermore, Applicants can find nothing in Matsumoto that adjusts cylinder mode selection, in any way, based on engine speed.

As such, the rejections based on Matsumoto should be withdrawn.

Xu

The Office action cites Cols. 7-10 of Xu. However, upon review, Applicants fail to find any description that relates to cylinder or valve deactivation for a cycle of the engine, let alone the specific modes recited in the independent claims. For example, Applicants fail to find any disclosure of operating the engine in a mode where at least one of a first cylinder and second cylinder opens and closes its intake and exhaust valves to induct air, combust said air with injected fuel, and exhaust combusted gas products, and the other of said first and second cylinders opens and closes at least one of its intake or exhaust valves while maintaining at least the other of its intake or exhaust valves closed during a cycle of the engine.

Rather, the cited disclosure appears to refer to concurrent opening and closing of the intake and exhaust valve during the intake event to provide a specific charge motion for later combustion. However, there is no distinction or description of operating different cylinders with different valve operation/deactivation during an engine cycle. Thus, Applicants respectfully submit that Xu is simply irrelevant to the pending claims, and that any rejections based on Xu be withdrawn. If the rejection based on Xu is maintained, Applicants respectfully request that the Office action recite specific locations in the reference distinctly showing each of the first, second, and third modes as claimed so that Applicants have an adequate opportunity to respond.

Ament

The Office action cites Cols. 3-6 of Ament. However, upon review, Applicants fail to find any description that relates to opening and closing cylinder valves of deactivated cylinders during an engine cycle, let alone the specific modes recited in the independent claims. For example, Applicants fail to find any disclosure of operating the engine in a mode where at least one of a first cylinder and second cylinder opens and closes its intake and exhaust valves to induct air, combust said air with injected fuel, and exhaust combusted gas products, and the other of said first and second cylinders opens and closes at least one of its intake or exhaust valves while maintaining at least the other of its intake or exhaust valves closed during a cycle of the engine.

Rather, the cited disclosure appears to refer to a partial cylinder deactivation mode where multiple additional fuel injections are made for purposed of purging a NOx trap. Thus, Applicants respectfully submit that Ament is simply irrelevant to the pending claims, and that any rejections based on Ament be withdrawn. If the rejection based on Ament is maintained, Applicants respectfully request that the Office action recite specific locations in the reference distinctly showing each of the first, second, and third modes as claimed so that Applicants have an adequate opportunity to respond.

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Conclusion

Applicants believe that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, Applicants respectfully request that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Please charge any cost incurred in the filing of this Response, along with any other costs, to Deposit Account No. 06-1510.

Respectfully submitted,

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